AMENDMENT UNDER 37 C.F.R. 1.116 – EXPEDITED PROCEDURE
Serial Number: 09/522,510
Filing Date: March 10, 2000
Title: SOFTWARE SET-VALUE PROFILING AND CODE REUSE
Assignee: Intel Corporation

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REMARKS

This responds to the Office Action mailed on August 26, 2004.

Claims 3, 6, 7, 9, 11, 12, 14-17, 21-24, 26, 28, 30, 32, and 33 are amended, claims 5 and 10 are canceled, and claims 36-41 are added; as a result, claims 3, 4, 6-9, and 11-41 are now pending in this application.

Request for Interview

Applicant respectfully requests an interview with the Examiner before any further action is taken. Please contact Andrew DeLizio at 612-371-2169.

New Claims

Applicant has added claims 36-41. Support for claim 36 can be found at least in the Instant Application at Page 10, Lines 28-29. Support for claim 37 can be found at least in the Instant Application at Page 9, Lines 23-25. Support for claim 38 can be found at least in the Instant Application at Page 9, Lines 21-23. Support for claim 39 can be found at least in the Instant Application at Page 4, Lines 1-10. Support for claims 40 and 41 can be found at least in the Instant Application at Page 6, Lines 15-28.

§102 Rejection of the Claims

Applicant respectfully submits that the cited references do not anticipate the amended claims 11, 16, 17, 20-23, and 27. Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough,

however, that the prior art reference discloses all the claimed elements in isolation. Rather,

"[a]nticipation requires the presence in a single prior reference disclosure of each and every

element of the claimed invention, *arranged as in the claim." Lindemann Maschinenfabrik GmbH

v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing

Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis

added).

Claim 11 was rejected under 35 USC § 102(b) as being anticipated by Keller et al. (U.S.

5,355,487).

Independent claim 11 has been amended to recite "determining whether a software

program region is a computation reuse region, wherein the determining includes, periodically

sampling a set of registers to obtain register values, wherein the register values are input values

of the software program region." (Emphasis added.) The Office Action asserts that Keller's PID,

SID, and address anticipate the claimed "input values of the software program region" because

they are inputs into Keller's profiler, which is a software program region. However, Applicant

respectfully submits that Keller's profiler is not the claimed "software program region" since it is

not being evaluated as a "computation reuse region". Additionally, Applicant cannot find any

passage in Keller that teaches or suggests the above cited amended claim feature.

Claims 16, 17, and 20-22 were rejected under 35 USC § 102(a) as being anticipated by

Calder et al. ("Value Profiling and Optimization", Journal of Instruction-Level Parallelism,

1999).

Applicant has amended independent claims 16 and 21 to recite "wherein S is an integer

greater than 1." Support for these amendments can be found in the Instant Application at Page 9,

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Lines 24-25. Applicant cannot find any passage in Calder that teaches or suggests the newly

amended features.

Claims 23 and 27 were rejected under 35 USC § 102(a) as being anticipated by Connors

et al. ("Compiler-Directed Dynamic Computation Reuse: Rationale and Initial Results",

Proceedings of the 32nd Annual International Symposium on Microarchitecture (MICRO),

1999).

Applicant has amended independent claims 23 and 27 to recite "periodically sampling

set-values for candidate reuse regions." Support for these amendments can be found in the

Instant Application at Page 9, Lines 21-28. Applicant cannot find any passage in Connors that

teaches or suggests the newly amended feature.

Dependent claims 17, 20, and 22 each depend, directly or indirectly, on one of

independent claims 11, 16, 21, 23, or 27.

For at least the reasons noted above, Applicant respectfully submits that the cited

references do not teach or suggest each and every element of claims 11, 16, 17, 20-23, and 27.

§103 Rejection of the Claims

Claims 3, 5-10, 12, 14, 15, 30, 31, 33, and 35 were rejected under 35 USC § 103(a) as

being unpatentable over Connors et al. in view of Feller et al. ("Value Profiling", IEEE, 1997),

and further in view of Keller et al.

The Examiner has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of

obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To do

that the Examiner must show that some objective teaching in the prior art or some knowledge

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generally available to one of ordinary skill in the art would lead an individual to combine the

relevant teaching of the references. *Id.*

The *Fine* court stated that:

> Obviousness is tested by "what the combined teaching of the references would
> have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413,
> 425, 208 USPQ 871, 878 (CCPA 1981)). But it "cannot be established by
> combining the teachings of the prior art to produce the claimed invention, absent
> some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732
> F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined
> *only* if there is some suggestion or incentive to do so." *Id.* (emphasis in original).

The M.P.E.P. adopts this line of reasoning, stating that

> In order for the Examiner to establish a *prima facie* case of obviousness, three
> base criteria must be met. First, there must be some suggestion or motivation,
> either in the references themselves or in the knowledge generally available to one
> of ordinary skill in the art, to modify the reference or to combine reference
> teachings. Second, there must be a reasonable expectation of success. Finally,
> the prior art reference (or references when combined) must teach or suggest all
> the claim limitations. The teaching or suggestion to make the claimed
> combination and the reasonable expectation of success must both be found in the
> prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re
> Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Applicant has amended independent claim 3 to recite "wherein <u>during the execution</u>, the

sampling is performed <u>every</u> S occurrences of the set-values, and wherein S is an integer greater

than 1." (Emphasis added.) The Office Action asserts that Feller "demonstrated that it was

known at the time of the invention to sample based on a sampling period during profiling."

Office Action Page 9, Last Paragraph. Feller discusses profiling every single occurrence of an

instruction until a convergence criteria is reached. After the convergence criterion is reached,

profiling for the instruction is turned off until a retry time period has lapsed. After the retry time

period has lapsed, profiling every single occurrence of the instruction is turned back on. See

Feller Page 267, Second Full Paragraph. As such, Applicant respectfully submits that Feller does not teach or suggest sampling every S occurrence, as claimed.

Applicant has amended independent claims 9, 30 and 33 to include features similar to that noted in the discussion of amended independent claim 3.

For the combination of Connors, Feller, and Keller to teach or suggest each and every element of independent claims 3, 9, 30 and 33, Connors and Keller must teach the above noted claim feature. Applicant cannot find any passage in Connors or Keller that teaches or suggests the above cited claim feature.

Claims 4, 6-10, and 35 each depend, directly or indirectly, on amended independent claims 3, 9, 30 and 33. As such, these claims are allowable for at least the reasons discussed above.

For at least the reasons noted above, Applicant respectfully submits that the combination of Connors, Feller and Keller does not teach or suggest each and every element of claims 3, 5-10, 30, 31, 33, and 35.

Dependent claims 12, 14, and 15 each depend, directly or indirectly, on independent claim 11. Additionally, dependent claim 12 includes features similar to those noted in the discussion of independent claim 3. For the combination of Connors, Feller, and Keller to teach or suggest each and every element of dependent claims 12, 14 and 15, Connors and Keller, either alone or in combination, must teach the above noted claim features (see discussion of claim 3 above.) Applicant cannot find any passage in the combination of any of Connors, Feller, or Keller that teach or suggest the above-cited claim features.

Claims 4 and 32 were rejected under 35 USC § 103(a) as being unpatentable over Connors et al. in view of Feller et al., further in view of Keller et al., and further in view of

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"Dictionary of Computing" (1996). Claims 13 and 34 were rejected under 35 USC § 103(a) as being unpatentable over Connors et al. in view of Feller et al., further in view of Keller et al. as applied to claim 12, and further in view of Chang (U.S. 5,933,628).

Dependent claims 4, 13, 32, and 34 each depend on one of claims 3, 12 and 30. As noted above, the combination of Connors, Feller and Keller does not teach or suggest each and every element of claims 3, 12, and 30. For any combination of Connors, Feller, Keller, the "Dictionary of Computing" (1996), or Chang to teach or suggest every element of dependent claims 4, 13, 32 and 34, the "Dictionary of Computing" (1996) or Chang must teach or suggest the elements not found in Connors, Feller and Keller. Applicant respectfully submits that the "Dictionary of Computing" (1996) does not teach or suggest the above noted claim feature (see discussion of claim 3). For at least that reason, Applicant respectfully submits that no combination of Connors, Feller, Keller, the "Dictionary of Computing" (1996) or Chang teaches or suggests each and every element of dependent claims 4 and 32.

Claims 18 and 19 were rejected under 35 USC § 103(a) as being unpatentable over Calder et al. in view of Chang. Dependent claims 18 and 19 each depend, directly or indirectly, on dependent claim 16. As noted above, Calder does not teach each and every element of independent claim 16. For the combination of Calder and Chang to teach or suggest each and every element of dependent claims 18 and 19, Chang must teach what Calder is missing. However, the Office Action did not point to, and Applicant cannot find, any passage in Chang that teaches or suggests the claimed "wherein S is an integer greater than 1."

Claims 24-26 and 28 were rejected under 35 USC § 103(a) as being unpatentable over Connors et al. in view of Keller et al. Claim 29 was rejected under 35 USC § 103(a) as being unpatentable over Connors et al. in view of Feller et al.

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Dependent claims 24-26, 28 and 29 each depend, directly or indirectly, on one of amended independent claims 23 and 27. As noted above (see discussion of claims 23 and 27), Applicant cannot find any passage in Feller or Keller that teaches or suggests the above noted features of the amended claims. Applicant cannot find any passage in Connors that teaches or suggests what Feller and Keller are lacking.

Official Notice

The Office Action takes Official Notice "that it was known at the time of the invention to instrument code as little as possible and hence use a small section of instrumentation code for multiple regions of the to be observed code, where possible as in item i) and ii)." Office Action Page 13, Second Paragraph. Applicant respectfully traverses this Official Notice and requests the Examiner to provide a reference that describes such an element. Absent a reference, it appears that the Examiner is using personal knowledge, so Applicant respectfully requests the Examiner submit an affidavit as required by 37 C.F.R. § 1.104(d)(2).

Reservation of Rights

Applicant does not admit that documents cited under 35 U.S.C. §§ 102(a), 102(e), 103/102(a), or 103/102(e) are prior art, and reserves the right to swear behind them at a later date. Arguments presented to distinguish such documents should not be construed as admissions that the documents are prior art.

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Conclusion

Based on the foregoing, Applicant respectfully requests that the rejections be withdrawn.

Applicant respectfully submits that the claims are in condition for allowance and notification to

that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney at

612-371-2169 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account

No. 19-0743.

Respectfully submitted,

YOUFENG WU

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Date ___11|24|04___   By _____Andrew DeLizio_____
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this __24th__ day of November, 2004.

_____Amy Moriarty_____   _____
Name   Signature